Bid Request No. 3-060418
Bid Opening April 18, 2006

March 28 2006

To: Equipment Dealers/Manufacturers

Dear Sir or Madam:

The Missouri Department of Transportation wishes to offer to bid flashing Arrow Boards contract. Bids are to be mailed to General Services-Fleet, P.O. Box 270, 1320 Creek Trail Drive, Jefferson City, MO 65102 and will be opened on April 18, 2006 at 2:00 p.m. Please note our Terms and Conditions enclosed that now contains all "boiler plate" information and special notes.

If you have any questions about this bid, please feel free to contact me at 573-526-7932, or by email at jerry.dunn@modot.mo.gov.

Sincerely,

Jerry Dunn

Jerry Dunn
General Services Specialist

PRICING SHEETS

Missouri Department of Transportation
General Services Division
Jefferson City, Missouri

The Missouri Department of Transportation desires to establish prices for the purchase of Flashing Arrow Boards for delivery to all of our ten district offices (see page 12).

Bid prices should be firm for purchase until April 30, 2007. Two (2) one-year extensions are available upon mutual consideration by Missouri Department of Transportation and the successful bidder. Allowance for inflation increases will be considered at the time of offer of these extensions.

Submit descriptive literature and specifications showing exact equipment you propose to furnish. Bid price to include the cost of two (2) Operator's Manuals, two (2) Parts Books, and two (2) Technical Service Manuals.

A COMPLETE LIST OR CATALOG DESCRIBING ALL AVAILABLE TRAINING MATERIALS RELATED TO THE ITEMS YOU ARE BIDDING MUST BE INCLUDED IN YOUR BID.

Warranty information beyond the Missouri Department of Transportation's requirement must be submitted with your bid.

The vendor shall demonstrate to the District prior to acceptance by the District, that the equipment delivered complies fully with the enclosed specifications.

NET DELIVERED FIRM PRICE is construed to be delivered complete and ready for use to the delivery destination, then tested and placed in service with detailed instructions and minimum one day initial training of Department personnel at any other Department facility, plus a one day follow up training with Department personnel per district. Dealer will contact the district to schedule the training classes. The district will have the latitude to schedule the training day that is best for their needs but will be required to give the dealer a 3 week notice of their requested training dates.

BID AWARD CRITERIA The item(s) will be awarded to the bidder with the lowest TOTAL COST. Total cost will be determined by adding to the base price the cost of all options requested.

Questions concerning specifications should be directed to Jerry Dunn at (573) 526-7932.

ITEM #1 - New, **Truck Mounted** Flashing Arrow Panel **(Truck-System Powered with LED Lamps)** meeting the enclosed Missouri Department of Transportation Specification

Make _____ **Model** _____

NET DELIVERED PRICE to any District Garage in the State of Missouri, in care of the District General Services Manager (See page 12)

EACH $_____

OPTIONS

OPTION	DESCRIPTION	Price
	Please list any vendor-recommended options relevant to this operation. Use additional sheets if necessary.	
Option 1		
Option 2		
Option 3		
Option 4		

Please submit a complete parts and options list with detailed pricing information for each make/mode of Flashing Arrow Board your company would be willing to provide. Please indicate below the percent (%) discount off Manufacturers Suggested Retail Prices (MSRP) for all Flashing Arrow Board options available in your data book or pricing guides.

% discount off MSRP for all Data Book or Pricing Guide Options: - % Discount _____

Delivery will be made approximately _____ days after receipt of order.

MISSOURI DEPARTMENT OF TRANSPORTATION (MoDOT)
TRUCK MOUNTED FLASHING ARROW PANEL SPECIFICATIONS
(TRUCK-SYSTEM POWERED, WITH LED LAMPS)

Description

The truck mounted flashing arrow panel shall consist of an arrow panel, mounting frame and rotating mechanism, remote control switches and circuitry, and a lockable control cabinet housing electronic components. Each unit shall be fully assembled when delivered.

Panel and Mounting Assembly

The arrow panel shall be aluminum and contain 15 LED lamps. Lamps shall be energized from remote control switches located inside the truck cab.

A nominal 5-inch, 360° tunnel visor with full attachment flange shall be provided for each lamp. Visors shall be attached to the panel with stainless steel machine screws and steel, blind-rivet nuts. Visors shall be removable without removing the screws. A nominal 1/2 inch, butyl rubber or neoprene gasket shall be provided between each lamp and the panel face to absorb vibration and prevent intrusion of moisture. The panel or lamp holder shall be notched to match a projection on the lamp to ensure proper lamp alignment. All lamps shall be replaceable from the front of the panel.

A lamp of the same type used on the panel face shall be provided on the back side of the panel and be continuously energized or flashed when the arrow panel is operating. A visor is not required on this lamp. It shall be located in the uppermost corner of the panel on the driver's side.

LED Lamps shall be 12-volt DC, PAR-46, yellow, LED type and each lamp shall meet the existing MoDOT specifications for visibility and legibility performance standards stated later in these specifications.

Overall size of the arrow panel shall be a nominal 3 feet by 6 feet.

Panel mounting height shall be a nominal 4 1/2 feet from the bottom of the support frame to the lowest point on the panel.

The arrow panel shall consist of a nominal 3-inch by 1-inch by 1/8 inch welded aluminum channel with a 1/16 inch thick aluminum sheet attached to the front and back. A nominal 6-inch square, removable panel shall be provided on the back panel to provide access to the control cable connector and ground wire bus. The access panel shall have a rubber or neoprene gasket. The interior of the panel shall be reinforced with aluminum spacers and nylon spacers. The front and back surfaces of the panel shall be painted non-reflective flat black. All wiring inside the arrow panel shall be corrosion resistant wiring and shall be attached to the panel approximately every 8-inches. Company names or logos shall not be placed on the arrow panel.

The arrow panel shall be supported on a four vertical post framework consisting of 2-inch by 2-inch by 1/8 inch welded steel tubing. All open ends of tubing shall be capped and welded shut. The panel shall be rotatable from a horizontal to a vertical position electrically, hydraulically, by winch and cable (minimum 1/4" diameter, galvanized, aircraft cable) with automatic brake, with a screw- type mechanism, or by a self-locking, manually operated square stainless steel tube. Manually operated winch mechanisms shall be located on the right, or passenger, side of the truck. (See the drawing on Attachment 2.). The supporting frame shall have a locking device to secure the panel in the horizontal and vertical positions. When in the horizontal position, the panel shall rest on a rigid frame support, relieving the load from the rotating device. Angle and cross bracing of the vertical supports shall be provided at the top and bottom of the supports to ensure a rigid frame.

The support frame shall be painted one coat of primer and one coat of Dupont Automotive Deluxe Enamel Code 93-75306 (yellow), or Chrome Enamel 13432 (yellow) of Federal Standard 595, or equal. A high-visibility, safety orange paint, such as Sherwin Williams Omaha Orange Paint, which is similar to Federal Standard 595B #12243, or equal, may be used in lieu of yellow paint.

Control and Wiring

The remote cab control switches shall provide left and right flashing arrows, a double flashing arrow, and caution modes of operation. The caution mode shall consist of flashing 4 lamps using the upper and lower lamps of the left and right arrowheads and may be energized when the cab control power switch is placed in the "on" position. Left and right flashing arrows shall flash 10 lamps, 5 in arrowhead and 5 in the horizontal shank, simultaneously. The double flashing arrow shall flash 13 lamps, 5 in each arrowhead and 3 in the horizontal shank, simultaneously.

The remote cab control shall include an on/off switch, a dim/bright selector switch, an operation mode selector switch, an LED "power -on" lamp, and be equipped for top of dash mounting. The control shall be provided with at least 30 feet of multi-conductor, salt-resistant, weatherproof cable. The remote cab control shall be assembled in a manner to allow easy access to internal circuitry and switches for service and repair, such as with machine screws. All electronic components shall be solid state and electrically protected by fuses or circuit breakers.

The flashing rate of the lamps shall not be less than 25 or greater than 40 flashes per minute. Lamp "on-time" shall be at least 50 percent.

Control circuitry shall provide a minimum 50 percent voltage reduction to all lamps during night operation. Dimming shall be by manual and automatic control. The photoelectric cell shall automatically reduce the flashing arrow light intensity as ambient light reduces by reducing the voltage to the lamps from 12-volts to 6 volts. When in the dimmed condition, voltage to any lamp shall be within 1.5 volts of the voltage to any other lamp. The weatherproof, photoelectric control shall be mounted on the bottom or side of the arrow panel with a watertight fitting.

A readily accessible cartridge fuse or circuit breaker shall be provided at the power supply end of the circuit between the power supply and cab power switch control. The fuse or breaker shall be rated to handle the maximum lamp load of 14 lamps. An additional fuse or breaker shall be located on the controller cabinet, protecting the circuit supplying the remote cab control.

The arrow panel electronic components shall be housed in a salt-resistant, weatherproof cabinet. The cabinet may be mounted to the arrow panel support frame or located in the truck cab behind the seat. The cabinet door shall contain a gasket and a non-ferrous metal locking mechanism with provision for padlocking if located on the support frame. A baffle shall be placed inside the cabinet to prevent water from reaching electrical components through ventilation louvers, if used. No openings will be permitted in the cabinet top. All wiring entrances to the cabinet shall be through salt-resistant, weatherproof connections. All electrical and electronic components in the cabinet shall be readily accessible, removable and serviceable. All electronic components shall be mounted on only one side of the circuit board. All components shall be labeled or coded and printed at their location on the circuit board. If condensation drains are provided in the bottom of the cabinet, they shall be protected from road splash. After assembly, all circuit boards and terminals shall be thoroughly cleaned and coated with clear acrylic or clear polyurethane.

All wiring and electrical and electronic equipment shall be capable of carrying an electrical load of 150 percent of maximum amperage rating of the unit. Solid-state devices containing non-accessible or non-replaceable components will not be permitted. Riveted load switches or heat sinks or solder connected integrated circuits will not be permitted or accepted.

Control circuitry shall provide a negative, 12-volt ground to each lamp at all times. Frame ground circuitry to the lamps will not be permitted. A ground circuit shall be supplied to a ground bus bar or terminal strip inside the arrow panel through a minimum of two # 12 AWG conductors. Individual ground circuits to each lamp shall be provided from the bus bar or terminal strip through a minimum of # 16 AWG conductors.

The positive, or plus, 12-volt power shall be supplied to each lamp through a minimum of # 16 AWG conductors from solid-state load switches in the control cabinet. A barrier terminal strip for the positive voltage conductors will not be required or permitted inside the arrow panel. Conductors shall connect from the lamps to the 14- pin, male connector on the bottom edge or front face of the panel. Continuous, plus, 12 volts to the lamps will not be permitted. The plus 12 volts to each lamp shall be reduced to zero voltage by the solid-state load switches.

The arrow panel and control cabinet shall be interconnected through a multi-conductor control cable or individual conductors in an electrical, flexible, salt-resistant, waterproof conduit. Length of the control cable shall be determined by the manufacturer, but not less than 30 feet if the control cabinet is located in the truck cab. Control cable length shall be sufficient to permit arrow panel rotation without binding or kinking the cable. A 14-pin, female connector shall be affixed to each end of the control cable. Caps or covers shall be provided for one end of the control cable and for the connector on the arrow panel to protect the connectors when disconnected, if the control is located in the truck cab.

A male, 14-pin connector shall be located on the bottom or side of the control cabinet. The connector shall be installed inside the control cabinet and retained by a clip or clips or stainless steel machine screws to permit removal from the cabinet without disconnecting wires from the control.

Control connectors shall be metal, salt-resistant, weatherproof, 14-contact Amphanol MS 3106 A 28-02 P plug, or equivalent amp-type connectors, with cable clamp and boot and MS 3102 A 28-

02 S socket. Power supply connectors shall be metal, salt-resistant weatherproof, 2-contact Amphanol MS 3106 A 22-01 P plug, or equivalent amp-type connectors, with cable clamp and boot and MS 3106 A 22-01 S socket.

Pin assignments shall be as shown in Attachment 1.

Electrical conductors between the cab control switches and control cabinet and between the control cabinet and arrow panel shall be Type THW UL approved, salt-resistant, weatherproof, multi-conductor cable or single conductors. Conductors shall be soft-drawn, Class B or C stranded copper wire meeting the requirements of IPCEA S-61-402, Part 2.

Electrical circuits between the control and power supply shall be UL approved single conductors in an electrical, flexible, salt-resistant, waterproof conduit or multiple conductor Type THW cable. Minimum conductor size shall be #10 AWG. Conductors shall be soft-drawn, Class B or C stranded copper wire meeting the requirements of IPCEA S-61-402, Part 2.

Crimp-on lugs, with amperage ratings equivalent to the conductor size, shall be used for all terminal connections of stranded copper conductors not connected to amphanol, or equivalent amp-type, connectors.

Performance

The flashing arrow must be visible on a sunny day for a distance of one mile. The arrow panel support frame shall contain a device to align the arrow panel to oncoming traffic and to adjust the arrow panel so its bottom edge is relatively level when in use. The panel lamp must be visible during the "on time" at an angle of 15° minimum to both the left and right of center and 4° minimum both up and down of center.

General

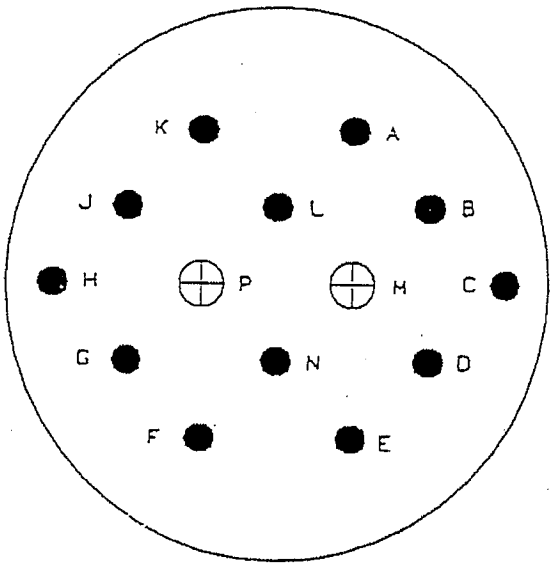
All units shall meet or exceed the specifications for advance warning arrow panels as listed in Part 6F.53 of the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) Millennium Edition, December, 2000. Units shall be skid mounted to slip into the back of dump truck.

Owner's Manual

The successful bidder shall furnish two Owner's Manuals for each arrow panel. Each manual shall include the manufacturer's instructions for maintenance and operation of the arrow panel and control. Each manual shall also include a detailed, schematic, wiring diagram showing all circuits and components from the power supply through the control to the arrow panel. The schematic diagram shall list all transistors, resistors, triacs, diodes and other components with the manufacturer's name and part number.

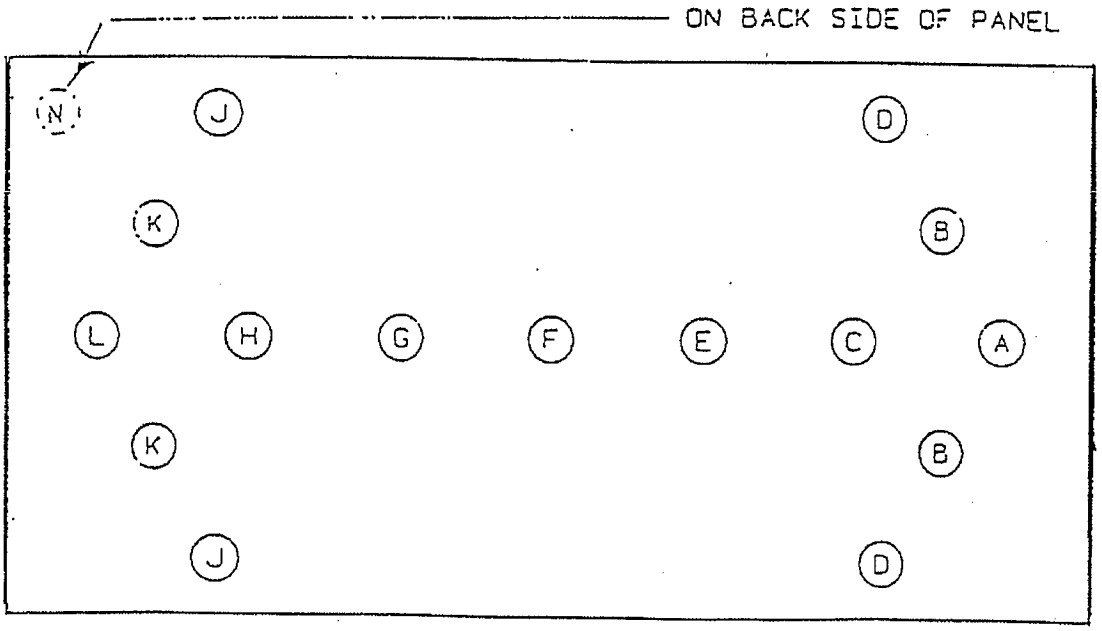
ATTACHMENT ONE

14 PIN
CONNECTOR



16 AWG

12 AWG
(GROUND)

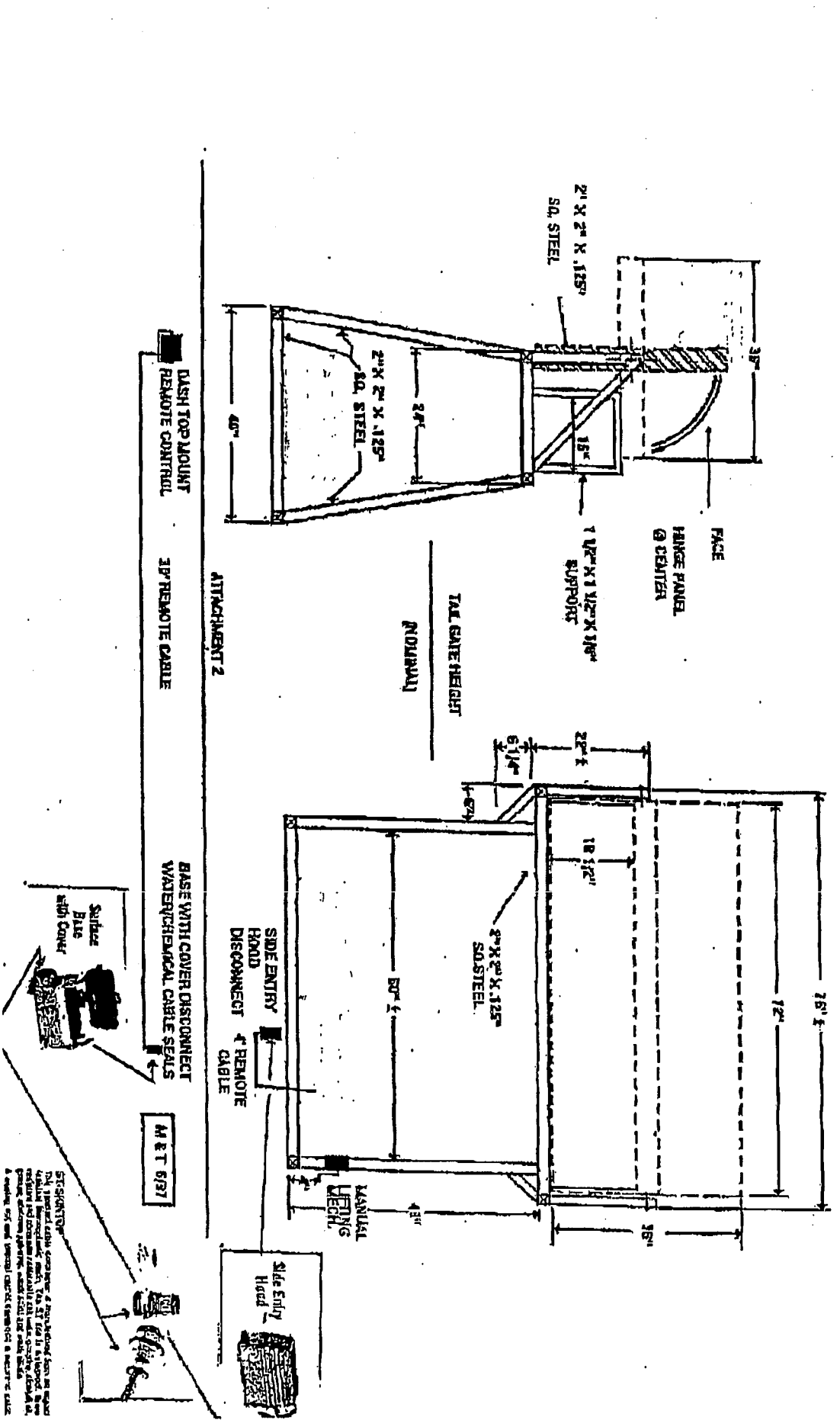


SUPPLIER TO DESIGNATE WIRING COLOR CODE.
PINS M AND P ARE NEGATIVE 12-VOLT GROUND.

MET 4-95

TRUCK POWERED LED ARROW PANEL

TRUCK MOUNTED ARROW PANEL



ITEM #2 – New **Truck Mounted** Flashing Arrow Panel **(Solar Powered with Led Lamps)** meeting the enclosed Missouri Department of Transportation Specification

Make _____ **Model**_____

NET DELIVERED PRICE to any District Garage in the State of Missouri, in care of the District General Services Manager (See page 12)

EACH $_____

OPTIONS

OPTION	DESCRIPTION	Price
	Please list any vendor-recommended options relevant to this operation. Use additional sheets if necessary.	
Option 1		
Option 2		
Option 3		
Option 4		

Please submit a complete parts and options list with detailed pricing information for each make/model of Flashing Arrow Board your company would be willing to provide. Please indicate below the percent (%) discount off Manufacturers Suggested Retail Prices (MSRP) for all Flashing Arrow Board options available in your data book or pricing guides.

% discount off MSRP for all Data Book or Pricing Guide Options: - % Discount _____

Delivery will be made approximately _____ days after receipt of order.

MISSOURI DEPARTMENT OF TRANSPORTATION (MoDOT)
TRUCK MOUNTED FLASHING ARROW PANEL SPECIFICATIONS
(SOLAR POWERED, WITH LED LAMPS)

Description

The truck mounted flashing arrow panel shall consist of an arrow panel, mounting frame and rotating mechanism, remote control switches and circuitry, a control cabinet housing electronic components mounted in a self-contained power supply. Each unit shall be fully assembled when delivered.

Panel and Mounting Assembly

The arrow panel shall be aluminum and contain a minimum of 15 LED (Light Emitting Diode) lamps. Lamps shall be energized from a control cabinet mounted inside the battery compartment and controlled by remote control switches located inside the truck cab.

A nominal 5 1/2-inch, 360° tunnel visor with full attachment flange shall be provided for each lamp. Visors shall be attached to the panel with stainless steel machine screws. Visors shall be removable without removing the screws. The panel or lamp holder shall be notched to match a projection on the lamp to ensure proper lamp alignment. All lamps shall be replaceable from the front of the panel.

A lamp of the same type used on the panel face shall be provided on the backside of the panel and be continuously energized or flashed when the arrow panel is operating. A visor is not required on this lamp. It shall be located in the uppermost corner of the panel on the driver's side.

Lamps shall be PAR-46, yellow, 5 1/2" dia., LED lamps, specifically designed for solar applications. Each lamp shall have an optical lense and contain enough light emitting diodes to meet the existing MoDOT specifications for visibility and legibility performance standards as stated later in these specifications.

Overall size of the arrow panel shall be a nominal 3 feet by 6 feet.

Panel mounting height shall be a nominal 4 1/2 feet from the bottom of the support frame to the lowest point on the panel.

The arrow panel shall consist of a nominal 3-inch by 1 inch by 1/8 inch welded aluminum channel with a 1/16 inch thick aluminum sheet attached to the front and back. The front and back surfaces of the panel shall be painted non-reflective flat black. All wiring inside the arrow panel shall be corrosion resistant wiring and shall be attached to the panel approximately every 8-inches. Company names or logos shall not be placed on the arrow panel.

The arrow panel shall be supported on a four vertical post framework consisting of a minimum of 2-inch by 2-inch by 1/8 inch thick welded steel tubing. All open ends of tubing shall be capped and welded shut. The panel shall be rotatable from a horizontal to a vertical position electrically, hydraulically, by winch and cable (minimum 1/4" diameter, galvanized aircraft cable) with automatic brake, with a screw type mechanism, or by a self-locking, manually operated square stainless steel tube. All manually operated winch mechanisms shall be mounted on the right, or passenger, side of the truck, as according to the drawing on Attachment 2.

The supporting frame shall have a locking device to secure the panel in the horizontal and vertical positions. When in the horizontal position, the panel shall rest on a rigid frame support, relieving the load from the rotating device. Angle and cross bracing of the vertical supports shall be provided at the top and bottom of the supports to ensure a rigid frame. (See the drawing on Attachment 2.)

The support frame shall be painted one coat of primer and one coat of Du pont Automotive Deluxe Enamel Code 93-75306 (yellow), or Chrome Enamel 13432 (yellow), of Federal Standard 595, or equal. A high-visibility, safety orange paint, such as Sherwin Williams Omaha Orange Paint, which is similar to Federal Standard 595B #12243, or equal, may be used in lieu of yellow paint.

Control and Wiring

The remote cab control switches shall provide left and right flashing arrows, a double flashing arrow, and caution modes of operation. The caution mode shall consist of flashing 4 lamps using the upper and lower lamps of the left and right arrowheads and may be energized when the cab control power switch is placed in the "on" position. Left and right flashing arrows shall flash 10 lamps; 5 in the arrowhead and 5 in the horizontal shank, simultaneously. The double flashing arrow shall flash 13 lamps; 5 in each arrowhead and 3 in the horizontal shank, simultaneously.

The remote cab control shall include an on/off switch, a dim/bright selector switch, an operation mode selector switch, an LED power-on lamp, and be equipped for top of dash mounting. The control shall be provided with at least 30 feet of multi-conductor, salt-resistant, weatherproof cable and a NEMA 4 surface base with cover connector plug to connect to the NEMA 4 side entry hood connector mounted approximately 4 feet from the base of the frame and controller. (See the drawing on Attachment 2.) All electronic components shall be solid state and electrically protected by fuses or circuit breakers. The remote cab control shall be assembled in a manner to allow easy access to internal circuitry and switches for service and repair, such as with machine screws.

The flashing rate of the lamps shall not be less than 25 or greater than 40 flashes per minute. Lamp "on-time" shall be at least 50 percent.

Control circuitry shall provide dimming of all lamps to prevent blinding during night operation. Dimming shall be by manual and automatic control. The photoelectric cell shall automatically reduce the flashing arrow light intensity as ambient light reduces. The weatherproof photoelectric control shall be mounted on the side of the battery box.

A readily accessible cartridge fuse or circuit breaker shall be provided at the power supply end of the circuit between the power supply and controller mounted inside of the battery box. The fuse or breaker shall be rated to handle the maximum lamp load of 14 lamps. An additional fuse or breaker shall be located on the controller cabinet, protecting the circuit supplying the remote cab control.

Solar Panels: Solar panels shall be a minimum of 100-110 watt panels, with a remote battery charger backup. Solar panels shall be mounted above top of arrow panel with 4 degree pitch from the horizontal position to encourage shedding of dirt and rainwater.

Battery Charger: A built-in 50 amp, 120 volts AC input, 12 volts DC output, battery charger with charge indicator shall be included and shall be mounted at the base of the frame of the arrow panel support, inside a lockable, weatherproof, battery box.

Batteries: Batteries shall be the deep-cycle type; a minimum of 3 batteries, 12 VDC marine-type or equivalent, with a minimum of 1000 amp-hours of energy when fully charged, or a minimum of 6 batteries, 6 VDC marine-type or equivalent, with a minimum of 700 amp-hours of energy when fully charged, wired to provide a 12-volt DC power supply.

Battery Box: A lockable, weatherproof, battery box, mounted at the base of the frame of the arrow panel support, shall be made of minimum 14-gauge steel, with louvered side panels for cross-flow ventilation and with the bottom and sides coated with acid-resistant protector. The battery box shall be large enough to sufficiently house and service the controller, batteries and charger.

Voltage Regulator: The voltage regulator shall be solid-state, micro-processor-based, utilizing constant positive drive voltage and pulse with modulation to optimize battery charging, measuring battery voltage and adjusting current from the solar panels so the batteries are not overcharged and also prevent overcharging of batteries by the solar panels when the sign is turned off. An automatic disconnect device shall be included to protect the entire system in case of low voltage.

Controller: A solid-state, LED optimized, controller shall be utilized to minimize wattage consumption and maximize battery life. The control circuitry shall provide a negative ground to each lamp at all times. Frame-ground circuitry to the lamps will not be permitted. Individual ground circuits to each lamp shall be provided. Positive power shall be supplied to each lamp through individual circuits from solid-state load switches in the control cabinet. The controller cabinet shall be assembled in a manner to allow easy access to internal control circuitry, such as with machine screws, for service and repair purposes. The controller shall be provided with approximately a 4 foot long weather and salt-resistant, multi-conductor cable and side entry hood connector to provide a means of connection from the remote cab control. (See the drawing on Attachment 2.) Continuous, positive 12-volts to the lamps will not be permitted. The positive power to each lamp shall be reduced to zero voltage by the solid-state load switches. It shall have reverse- polarity and short-circuit protection. The voltage regulator and controller shall be in a lockable, weatherproof, aluminum enclosure mounted inside the lockable, weatherproof, battery box mounted at the base of the frame.

Disconnect and Enclosures: Disconnect plug and receptacle shall be determined by the current, voltage and number of contacts required for proper operation. Connectors shall have screw terminations and accommodate a wire size of up to # 12 AWG. The male connector shall be enclosed in a NEMA 4 rated surface base enclosure with cover. The female connector shall be enclosed in a NEMA 4 side-entry hood enclosure. Multi-conductor cable shall enter the bottom of the enclosures through a waterproof, flame-resistant and salt and corrosion resistant cable connector with a sealing nut and internal ratchet containing a neoprene cable gland. (See the drawing on Attachment 2.)

Locks: A lockable box shall be mounted on the frame of the arrow panel support to protect the batteries and battery charger from theft and damage from falling or flying objects.

General

All units shall meet or exceed the specifications for advance warning arrow panels as listed in Part 6F.53 of the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) Millennium Edition, December, 2000. Units shall be skid mounted to slip into the back of dump trucks.

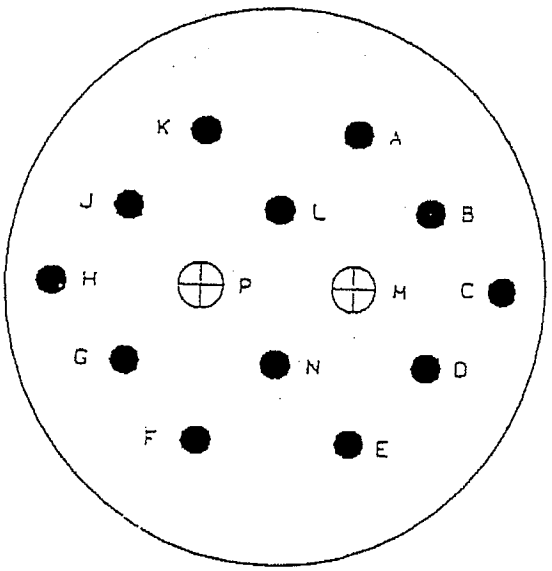
Performance: The flashing arrow must be visible on a sunny day for a distance of one mile. The flashing arrow must be able to operate for 20 continuous days in the single arrow mode during day/night light conditions with the solar panel disconnected or covered.. A device shall be provided to indicate the remaining charge in the batteries. The arrow panel support frame shall contain a device to align the arrow panel to oncoming traffic and to adjust the arrow panel so its bottom edge is relatively level when in use. The panel lamp must be visible during the "on-time" at an angle of 15° minimum to both the left and right of center and 4° minimum both up and down of center.

Owner's Manual

The successful bidder shall furnish two Owner's Manuals for each arrow panel. Each manual shall include the manufacturer's instructions for maintenance and operation of the power supply, arrow panel and control. Each manual shall also include a detailed, schematic, wiring diagram showing all circuits and components from the power supply through the control to the arrow panel. The schematic diagram shall list all transistors, resistors, triacs, diodes and other components with the manufacturer's name and part number.

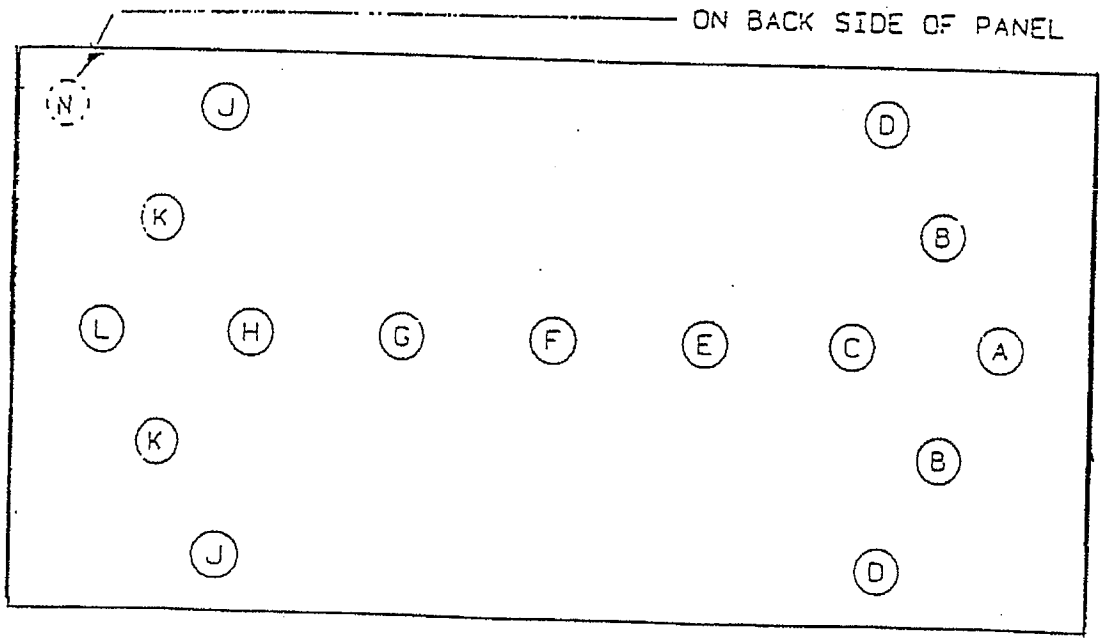
ATTACHMENT ONE

14 PIN
CONNECTOR



● 16 AWG

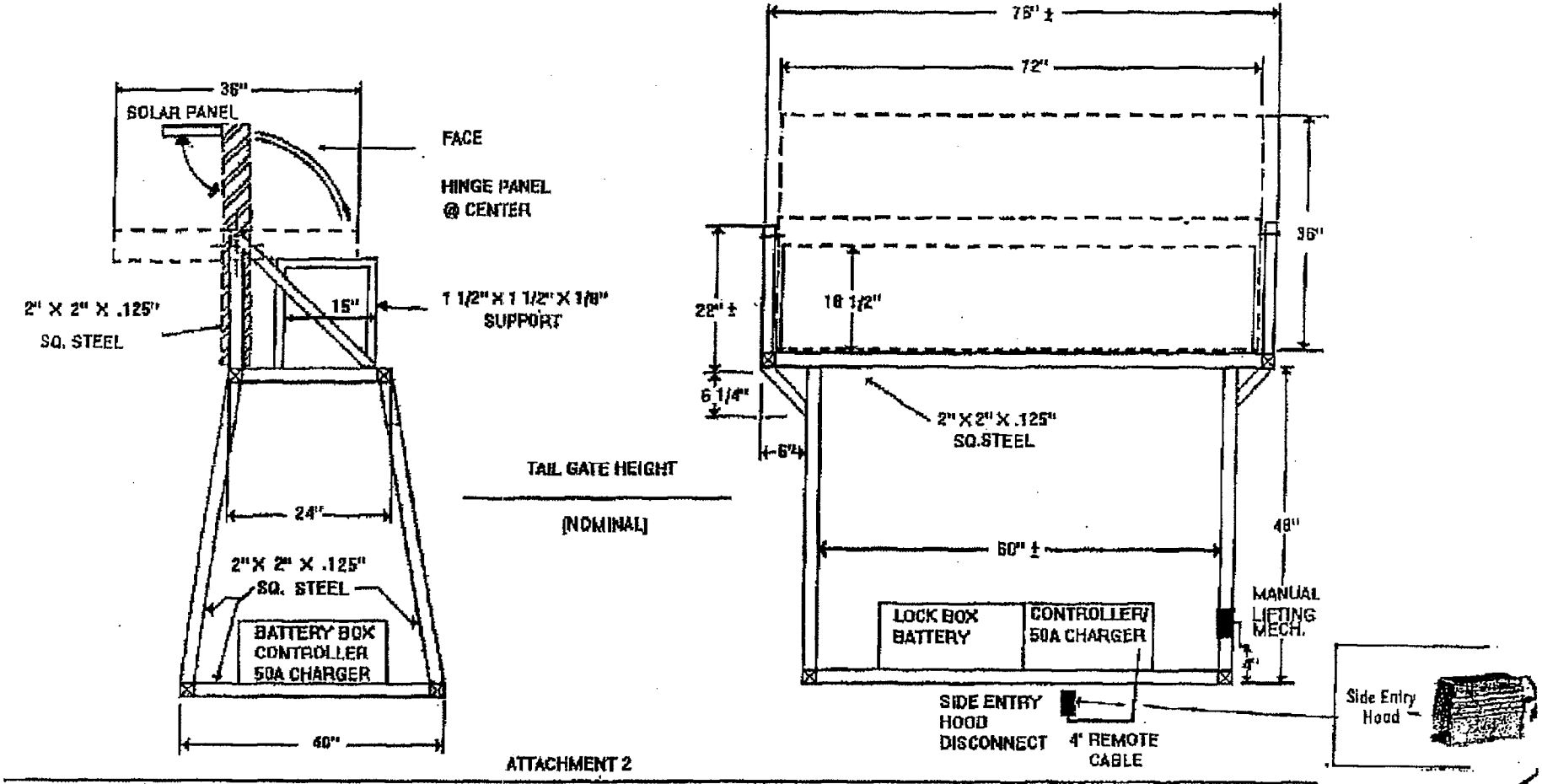
⊕ 12 AWG (GROUND)



SUPPLIER TO DESIGNATE WIRING COLOR CODE.
PINS M AND P ARE NEGATIVE 12-VOLT GROUND.

MET 4 OF

SOLAR TRUCK MOUNTED ARROW PANEL



ITEM #3 – New, **Trailer Mounted** Flashing Arrow Panel **(Solar Powered with Led Lamps)** meeting the enclosed Missouri Department of Transportation Specification.

NET DELIVERED PRICE to any District Garage in the State of Missouri, in care of the District General Services Manager (See page 12)

Make _____ **Model**_____

EACH $_____

OPTIONS

OPTION	DESCRIPTION	Price
	Please list any vendor-recommended options relevant to this operation. Use additional sheets if necessary.	
Option 1		
Option 2		
Option 3		
Option 4		

Please submit a complete parts and options list with detailed pricing information for each make/model of Flashing Arrow Board your company would be willing to provide. Please indicate below the percent (%) discount off Manufacturers Suggested Retail Prices (MSRP) for all Flashing Arrow Board options available in your data book or pricing guides.

% discount off MSRP for all Data Book or Pricing Guide Options: - % Discount _____

Delivery will be made approximately _____ days after receipt of order.

MISSOURI DEPARTMENT OF TRANSPORTATION (MoDOT)
TRAILER MOUNTED FLASHING ARROW PANEL SPECIFICATIONS
(SOLAR POWERED, WITH LED LAMPS)

Description

The trailer mounted flashing arrow panel shall consist of an arrow panel, mounting frame and rotating mechanism, control switches and circuitry, a control box housing electronic components, trailer, and self-contained power supply. Each unit shall be fully assembled when delivered.

Panel and Mounting Assembly

The arrow panel shall be aluminum and contain a minimum of 15 LED (Light Emitting Diode) lamps. Lamps shall be energized from control switches located in a lockable weatherproof aluminum box located in the arrow panel support frame.

A nominal 5 1/2-inch, 360° tunnel visor with full-attachment flange shall be provided for each lamp. Visors shall be attached to the panel with stainless steel machine screws. Visors shall be removable without removing the screws. The panel or lamp holder shall be notched to match a projection on the lamp to ensure proper lamp alignment. All lamps shall be replaceable from the front of the panel.

A lamp of the same type used on the panel face shall be provided on the backside of the panel and be continuously energized or flashed when the arrow panel is operating. A visor is not required on this lamp. It shall be located in the uppermost corner of the panel on the driver's side.

Lamps shall be PAR-46 yellow, 5 1/2" DIA., LED lamps specifically designed for solar applications. Each lamp shall have an optical lense and contain enough light emitting diodes to meet the existing MoDOT specifications for visibility and legibility performance standards as stated later in these specifications.

Overall size of the arrow panel shall be a nominal 4 feet by 8 feet.

Panel mounting height shall be 7 to 9 feet from the roadway surface to the lowest point on the panel. The bottom edge of the panel shall be relatively level when in use.

The arrow panel shall consist of a nominal 3-inch by 1 inch by 1/8 inch welded aluminum channel with a 1/16 inch thick aluminum sheet attached to the front and back. The front and back surfaces of the panel shall be painted non-reflective flat black. All wiring inside the arrow panel shall be corrosion resistant wiring and shall be attached to the panel approximately every 8-inches. Company names or logos shall not be placed on the arrow panel.

The arrow panel shall be supported on a two or four vertical post framework consisting of a minimum of 2-inch by 2-inch by 1/8 inches thick welded steel tubing. All open ends of tubing shall be capped and welded shut. Steel supports shall be welded to the deck plate and the deck plate welded to the frame and cross members. The panel shall be rotatable from a horizontal to a vertical position electrically, hydraulically, by winch and cable (minimum 1/4- inch diameter galvanized aircraft cable) with automatic brake, with a screw type mechanism, or by a self-locking, manually operated square stainless steel tube. The supporting frame shall have a locking device to secure the panel in the horizontal and vertical positions. When in the

horizontal position, the panel shall rest on a rigid frame support, relieving the load from the rotating device. Angle and cross bracing of the vertical supports shall be provided at the top and bottom of the supports to ensure a rigid frame. Manually operated winch mechanisms shall be located on the right, or passenger side, of the trailer.

The support frame shall be painted one coat of primer and one coat of Dupont Automotive Deluxe Enamel Code 93-75306 (yellow), or Chrome Enamel 13432 (yellow), of Federal Standard 595, or equal. A high-visibility, Safety Orange Paint, such as Sherwin Williams Omaha Orange Paint, which is similar to Federal Standard 595B #12243, or equal, may be used in lieu of yellow paint.

Control and Wiring

The control switches shall provide left and right flashing arrows, double flashing arrow, and caution modes of operation. The caution mode shall consist of flashing 4 lamps using the upper and lower lamps of the left and right arrowheads. Left and right flashing arrows shall flash 10 lamps, 5 in the arrowhead and 5 in the horizontal shank simultaneously. The double flashing arrow shall flash 13 lamps, 5 in each arrowhead and 3 in the horizontal shank simultaneously.

The control shall include an on/off switch, a dim/bright selector switch, an operation mode selector switch, and a photoelectric cell. All electronic components shall be solid state and electrically protected by fuses or circuit breakers. All cables and control wiring shall enter the control cabinet from either the back or the bottom through salt-resistant, weatherproof connectors. No external or spliced wire connections will be accepted outside of the control cabinet.

The flashing rate of the lamps shall not be less than 25 or greater than 40 flashes per minute. Lamp "on-time" shall be at least 50 percent.

Control circuitry shall provide dimming of all lamps to prevent blinding during night operation. Dimming shall be by manual and automatic control. The photoelectric cell shall automatically reduce the flashing arrow light intensity as ambient light reduces. The photoelectric control shall be mounted on the side or bottom of the arrow control cabinet.

A readily accessible cartridge fuse or circuit breaker shall be provided in the circuit between the power supply and arrow panel control. The fuse or breaker shall be rated to handle the maximum lamp load of 14 lamps. The fuse or breaker shall be located in the control cabinet.

Solar Panels: Solar panels shall be a minimum of 100-110 watt panels, with a remote battery charger backup. Solar panels shall be mounted above top of arrow panel with a 4 degree pitch from the horizontal position to encourage shedding of dirt and rainwater.

Battery Charger: A built in 50 amp, 120 volt AC input, 12 volts DC output battery charger with charge indicator shall be included and shall be mounted at the base of the frame of the arrow panel support, inside a lockable, weatherproof, battery box.

Batteries: Batteries shall be the deep-cycle type; a minimum of 3 batteries, 12 VDC marine-type or equivalent,with a minimum of 1000 amp-hours of energy when fully charged or a minimum of 6 batteries, 6 VDC marine-type or equivalent, with a minimum of 700 amp-hours of energy when fully charged, wired to provide a 12-volt DC power supply.

Battery Box: A lockable, weatherproof, battery box shall be centered over the trailer axle, made of minimum 14-gauge steel, with louvered side panels for cross-flow ventilation and with bottom and sides coated with acid-resistant protector.

Voltage Regulator: The voltage regulator shall be solid-state micro-processor-based, utilizing constant positive drive voltage and pulse with modulation to optimize battery charging; measuring battery voltage and adjusting current from the solar panels so the batteries are not overcharged, and also preventing overcharging of batteries by the solar panels when the sign is turned off. An automatic disconnect device shall be included to protect the entire system in case of low voltage.

Controller: A solid-state, LED optimized, controller shall be utilized to minimize wattage consumption and maximize battery life. Control circuitry shall provide a negative ground to each lamp at all times. Frame-ground circuitry to the lamps will not be permitted. Individual ground circuits to each lamp shall be provided. Positive power shall be supplied to each lamp through individual circuits from solid-state load switches in the control cabinet. The controller cabinet shall be assembled in a manner to allow easy access to internal control circuitry, such as with machine screws for service and repair purposes. Continuous, positive 12-volts to the lamp will not be permitted. The positive power to each lamp shall be reduced to zero voltage by the solid state load switches. It shall have reverse-polarity and short-circuit protection. The voltage regulator and controller shall be in a lockable, weatherproof, aluminum box located on the frame of the arrow panel support.

Locks: A lockable box shall be mounted on the trailer deck to protect the batteries and battery charger from theft and damage from falling or flying objects.

Performance: The flashing arrow must be visible on a sunny day for a distance of one mile. The flashing arrow must be able to operate for 20 continuous days in the single arrow mode during day/night light conditions with the solar panel disconnected or covered. A device shall be provided to indicate the remaining charge in the batteries. The arrow panel support frame shall contain a device to align the arrow panel to oncoming traffic and to adjust the arrow panel so its bottom edge is relatively level when in use. The panel lamp must be visible during the "on time" at an angle of 15° minimum to both the left and right of center and 4° minimum both up and down of center.

Trailer

Dimensions: Minimum trailer dimensions shall be length 110" and width 76" (fender to fender).
Frame: Structural steel tubing, (minimum square tubing 2 1/2" x 2 1/2" x 11-gauge wall thickness or minimum 2" square tubing x 1/8" wall thickness) minimum 3 cross braces (with tie-down loops on front corners.)
Axle: Single, minimum 2,000-pound capacity, tubular, with 5-hole, 4.5" B.C. circle pattern on idler hub.
Wheels: 15-inch steel, safety rim, 5 lug bolts.
Tires: 15-inch, load range B, tubeless, radial highway tread (P205/75R15 minimum.)
Springs: Minimum 3-leaf, double eye, minimum 1,200 lb. capacity for each spring.
Tongue: 3-inch x 3-inch x 3/16 inch steel tubing (removable for shipping and to prevent theft.). Tongue weight approximately 10-15 percent of gross weight. Minimum 4-foot hitch-to-trailer clearance.
Deck: 12 sq. ft. minimum, 10 gauge, smooth plate or open deck.
Fenders: 16 gauge steel, inside closed in above deck, round, full wheel coverage.

Safety Chain: Two, 5/16 inch x 34-inch long plated steel chains connected to a loop that is welded to the tongue. Chain shall have yield strength equal to weight of trailer and payload, or greater. Chain loop shall have yield strength equal to chain, or greater.

Screw Jack: Tongue mounted, 2,000-pound capacity, steel base 4" x 4" square foot, minimum size and capacity.

Leveling Legs: Adjustable on 1" increments with foot pads (4" x 4" minimum), mounted on four corners of frame, perforated 1 3/4" square tube x 12-gauge wall locked in place by 3/8" diameter snapper pins, secured to trailer frame by wire cable or chain.

Hitch: Easily removable combination, 2" diameter ball coupler and a 3 inch inside diameter, flat pintle ring, adjustable 24-inch to 36-inch, in 2-inch increments.

Paint: Entire trailer - one coat primer, one coat Dupont Automotive Deluxe Enamel Code 93-75306 (yellow) or Chrome Enamel 13432 (yellow) of Federal Standard 595, including all surfaces under deck and on underside of fenders. A high-visibility, Safety Orange Paint, such as Sherwin Williams Omaha Orange Paint, which is similar to Federal Standard 595B #12243, or equal, may be used in lieu of yellow paint.

Lights: (DOT Approved) 12-volt, two tail/stop/turn signal; side, rear and tongue reflectors. Wires shall be identified as to function.

General

All units shall meet or exceed the specifications for advance warning arrow panels as listed in Part 6F.53 of the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) Millennium Edition, December, 2000.

Owner's Manual

The successful bidder shall furnish two Owner's Manuals for each arrow panel. Each manual shall include the manufacturer's instructions for maintenance and operation of the power supply, arrow panel and control. Each manual shall also include a detailed, schematic, wiring diagram
showing all circuits and components from the power supply through the control to the arrow panel. The schematic diagram shall list all transistors, resistors, triacs, diodes and other components with the manufacturer's name and part number.

ITEM #4 – New, **Trailer Mounted** Flashing Arrow Panel **(Diesel Engine Powered with Sealed Beam Lamps))** meeting the enclosed Missouri Department of Transportation Specification

NET DELIVERED PRICE to any District Garage in the State of Missouri, in care of the District General Services Manager (See page 12)

Make _____ **Model**_____

EACH $_____

OPTIONS

OPTION	DESCRIPTION	Price
	Please list any vendor-recommended options relevant to this operation. Use additional sheets if necessary.	
Option 1		
Option 2		
Option 3		
Option 4		

Please submit a complete parts and options list with detailed pricing information for each make/model of Flashing Arrow Board your company would be willing to provide. Please indicate below the percent (%) discount off Manufacturers Suggested Retail Prices (MSRP) for all Flashing Arrow Board options available in your data book or pricing guides.

% discount off MSRP for all Data Book or Pricing Guide Options: - % Discount _____

Delivery will be made approximately _____ days after receipt of order.

MISSOURI DEPARTMENT OF TRANSPORTATION (MoDOT)
TRAILER MOUNTED FLASHING ARROW PANEL SPECIFICATIONS
(DIESEL ENGINE POWERED, WITH SEALED BEAM LAMPS)

Description

The trailer mounted flashing arrow panel shall consist of an arrow panel, mounting frame and rotating mechanism, control switches and circuitry, trailer, and self-contained power supply. Each unit shall be fully assembled when delivered.

Panel and Mounting Assembly

The arrow panel shall be aluminum and contain 15 lamps. Lamps shall be energized from control switches located in a lockable, weatherproof aluminum box located on the arrow panel support frame, power supply cover, or under the power supply cover.

A nominal 5-inch, 360° tunnel visor with full attachment flange shall be provided for each lamp. Visors shall be attached to the panel with stainless steel machine screws and steel, blind rivet nuts. Visors shall be removable without removing the screws. A nominal 1/2 inch, butyl rubber or neoprene gasket shall be provided between each lamp and the panel face to absorb vibration and prevent intrusion of moisture. The panel or lamp holder shall be notched to match a projection on the lamp to ensure proper lamp alignment. All lamps shall be replaceable from the front of the panel.

A lamp of the same type used on the panel face shall be provided on the back side of the panel and be continuously energized or flashed when the arrow panel is operating. A visor is not required on this lamp. It shall be located in the uppermost corner of the panel on the driver's side.

Lamps shall be 12-volt DC, 18-watt, PAR-46, (NO. 4412A), yellow, sealed-beam type and each lamp shall meet the existing MoDOT specifications for visibility and legibility performance standards as stated later in these specifications.

Overall size of the arrow panel shall be a nominal 4 feet by 8 feet.

Panel mounting height shall be 7 to 9 feet from the roadway surface to the lowest point on the panel. The bottom edge of the panel shall be relatively level when in use.

The arrow panel shall consist of a nominal 3-inch by 1 inch by 1/8 inch welded aluminum channel with a 1/16 inch thick aluminum sheet attached to the front and back. A nominal 6-inch square removable panel shall be provided on the back panel to provide access to the control cable connector and ground wire bus. The access panel shall have a rubber or neoprene gasket. The interior of the panel shall be reinforced with aluminum spacers and nylon spacers. The front and back surfaces of the panel shall be painted non-reflective flat black. All wiring inside the arrow

panel shall be corrosion resistant wiring and shall be attached to the panel approximately every 8-inches. Company names or logos shall not be placed on the arrow panel.

The arrow panel shall be supported on a two or four vertical post framework consisting of 2-inch by 2-inch by 1/8 inch welded steel tubing. All tubing shall be capped and welded shut. Steel supports shall be welded to the deck plate and the deck plate welded to the frame and cross members. The panel shall be rotatable from a horizontal to a vertical position electrically, hydraulically, by winch and cable (minimum 1/4-inch diameter galvanized aircraft cable) with automatic brake, with a screw type mechanism, or by a self-locking, manually operated square stainless steel tube. The supporting frame shall have a locking device to secure the panel in the horizontal and vertical positions. When in the horizontal position, the panel shall rest on a rigid frame support, relieving the load from the rotating device. Angle and cross bracing of the vertical supports shall be provided at the top and bottom of the supports to ensure a rigid frame. Manually operated winch mechanisms shall be located on the right, or passenger, side of the trailer.

The support frame shall be painted one coat of primer and one coat of Du pont Automotive Deluxe Enamel Code 93-75306 (yellow), or Chrome Enamel 13432 (yellow), of Federal Standard 595, or equal. A high visibility safety orange paint, such as Sherwin Williams Omaha Orange Paint, which is similar to Federal Standard 595B #12243, or equal, may be used in lieu of yellow paint.

Control and Wiring

The control switches shall provide left and right flashing arrows, a double flashing arrow, and caution modes of operation. The caution mode shall consist of flashing 4 lamps using the upper and lower lamps of the left and right arrowheads. Left and right flashing arrows shall flash 10 lamps, 5 in the arrowhead and 5 in the horizontal shank, simultaneously. The double flashing arrow shall flash 13 lamps, 5 in each arrowhead and 3 in the horizontal shank, simultaneously.

The control shall include an on/off switch, a dim/bright selector switch, an operation mode selector switch, a photoelectric cell, flasher and load relays. All electronic components, except flasher and load relays, shall be solid state and electrically protected by fuses or circuit breakers. All cables and control wiring shall enter the control cabinet from either the back or bottom through salt-resistant, weatherproof connectors. No external or spliced wire connections will be accepted outside of the control cabinet.

The flashing rate of the lamps shall not be less than 25 or greater than 40 flashes per minute. Lamp "on-time" shall be at least 50 percent.

Control circuitry shall provide a minimum 50 percent voltage reduction to all lamps during night operation. Dimming shall be by manual and automatic control. The photoelectric cell shall automatically reduce the flashing arrow light intensity as ambient light reduces, by reducing the voltage to the lamps from 12-volts to 6 volts. When in the dimmed condition, voltage to any lamp shall be within 1.5 volts of the voltage to any other lamp. The photoelectric control shall be mounted on the side or bottom of the arrow control cabinet.

A readily accessible cartridge fuse or circuit breaker shall be provided in the circuit between the power supply and arrow panel control. The fuse or breaker shall be rated to handle the maximum lamp load of 14 lamps. The fuse or breaker shall be located in the control cabinet.

The arrow panel control shall be housed in a removable, weather and splash proof cabinet. The cabinet shall be securely mounted to the arrow panel support frame, or on or under the power supply protective cover. Removal of the entire cabinet shall be accomplished by disconnecting two amphanol, or equivalent amp-type, cable connectors and removing no more than two cabinet attachment bolts. The cabinet door shall contain a gasket and a non-ferrous metal locking mechanism with provision for padlocking, if the control is not located under the power supply cover. A baffle shall be placed inside the cabinet to prevent water from reaching electrical components through ventilation louvers, if used. No openings will be permitted in the cabinet top. All wiring entrances to the cabinet shall be through salt-resistant, weatherproof connections. All electrical and electronic components in the cabinet shall be readily accessible, removable and serviceable. All electronic components shall be mounted on only one side of the circuit board. All components shall be labeled or coded and printed at their location on the circuit board. If condensation drains are provided in the bottom of the cabinet, they shall be protected from road splash. After assembly, all circuit boards and terminals shall be thoroughly cleaned and coated with clear acrylic or clear polyurethane.

All wiring and electrical and electronic equipment shall be capable of carrying an electrical load of 150 percent of maximum amperage rating of the unit. Solid-state devices containing non-accessible or non-replaceable components will not be permitted. Riveted load switches or heat sinks or solder connected integrated circuits will not be permitted or accepted.

Control circuitry shall provide a negative 12-volt ground to each lamp at all times. Frame ground circuitry to the lamps will not be permitted. A ground circuit shall be supplied to a ground bus bar or terminal strip inside the arrow panel through a minimum of two #12 AWG conductors. Individual ground circuits to each lamp shall be provided from the bus bar or terminal strip through minimum of #16 AWG conductors.

The positive, or plus, 12-volt power shall be supplied to each lamp through a minimum #16 AWG conductors from solid state load switches in the control cabinet. A barrier terminal strip for the positive voltage conductors will not be required or permitted inside the arrow panel. Conductors shall connect from the lamps to the 14-pin, male connector on the bottom edge or front face of the panel. Continuous, plus, 12 volts to the lamps will not be permitted. The plus 12 volts to each lamp shall be reduced to zero voltage by the solid-state load switches.

The arrow panel and control cabinet shall be interconnected through a multi-conductor control cable or individual conductors in an electrical, flexible, salt-resistant, waterproof conduit. The length of the control cable shall be determined by the manufacturer. Control cable length shall be sufficient to permit arrow panel rotation without binding or kinking the cable. A 14-pin, female connector shall be affixed to each end of the control cable.

A male, 14-pin connector shall be located on the bottom or side of the control cabinet. The connector shall be installed inside the control cabinet and retained by a clip or clips or stainless steel machine screws to permit removal from the cabinet without disconnecting wires from the control.

Control connectors shall be metal, weatherproof, 14-contact Amphanol MS 3106 A 28-02 P plug, or equivalent, amp-type connectors, with cable clamp and boot and MS 3102 A 28-02 S socket. Power supply connectors shall be metal, weatherproof, 2-contact Amphanol MS 3106 A 22-01 P plug, or equivalent, amp-type connectors, with cable clamp and boot and MS 3106 A 22-01 S socket.

Electrical conductors between the control and arrow panel shall be Type THW UL approved, salt-resistant, weatherproof, multi-conductor cable or single conductors. Conductors shall be soft -drawn, Class B or C stranded copper wire meeting the requirements of IPCEA S-61-402, Part 2.

Electrical circuits between the control and power supply shall be UL approved, single conductors in an electrical, flexible, salt-resistant, waterproof conduit or multiple conductor Type THW cable. Minimum conductor size shall be #10 AWG. Conductors shall be soft drawn Class B or C stranded copper wire meeting the requirements of IPCEA S-61-402, Part 2.

Crimp-on lugs, with amperage ratings equivalent to the conductor size, shall be used for all terminal connections of stranded copper conductors not connected to amphanol, or equivalent amp type, connectors.

Trailer

Dimensions: Minimum trailer dimensions shall be length 110" and width 76" (fender to fender).
Frame: Structural steel tubing or channel, minimum 3 cross braces, with tie-down loops on front corners.
Axle: Single, minimum 3,500-pound capacity, tubular, with 5-hole 4.5" B.C. circle pattern on idler hub.
Wheels: 15-inch steel, safety rim, 5 lug bolts.
Tires: 15-inch, tubeless, radial, highway tread. Size and rating to match axle capacity.
Springs: Minimum 4-leaf, double eye.
Tongue: 3-inch x 3-inch x 3/16 inch steel tubing Y-braced to trailer frame, removable for shipping and to prevent theft. Tongue weight approximately 10-15 percent of gross weight. Minimum 4-foot hitch-to-trailer clearance.
Deck: 32 sq. ft., 1/8 inch steel safety-tread plate.
Fuel Tank: Minimum 20-gallon with gauge. Mounted below deck with filler cap access through deck plate. Protective metal guard on front and bottom if tank is not metal.
Fuel Valve: In-line, lever operated, on-off.
Power Supply Cover: Hinged, 16 gauge steel, expanded metal sides or vents, lockable. Hinge bolted or riveted through deck plate.
Starting Battery Enclosure: 14 gauge steel, under deck, minimum 2 drain holes, lockable.
Fenders: 16 gauge steel, inside closed in above deck, round, full-wheel coverage.
Safety Chain: Two, 5/16 inch x 34-inch long, plated, steel chains connected to a loop that is welded to the tongue. Chain shall have yield strength equal to weight of trailer and payload or greater. Chain loop shall have yield strength equal to chain, or greater.
Screw Jack: Tongue mounted, 2,000-pound capacity, steel base 4" x 4" square foot, minimum size and capacity.

Leveling Legs: Adjustable, on 1" increments, with foot pads (4" x 4" minimum), mounted on

four corners of frame, perforated 1 3/4" square tube x 12 gauge wall, locked in place by 3/8" diameter snapper pins, secured to the trailer frame by a wire cable or chain..

Hitch: Easily removable combination 2" diameter ball coupler and a 3-inch inside diameter flat pintle ring, adjustable 24-inch to 36-inch, in 2-inch increments.

Paint: Entire trailer - one coat primer, one coat Du pont Automotive Deluxe Enamel Code 93-75306 (yellow) or Chrome Enamel 13432 (yellow) of Federal Standard 595, or equal, including all surfaces under deck and on underside of fenders. A high-visibility, safety orange paint, such as Sherwin Williams Omaha Orange Paint, which is similar to Federal Standard 595B #12243, or equal, may be used in lieu of the yellow paint.

Lights: (DOT Approved) 12-volt, two tail/stop/turn signal; side, rear and tongue reflectors. No electrical connector required. Wires shall be identified as to function.

Power Supply - Diesel Engine Driven Generator Unit

Engine: Diesel, Lombardini 6LD260, 4 HP at 2800 RPM, 262 cc, 3-quart deep-sump, oil capacity with spin-on filter, dry cartridge air filter, electric and manual starter, run/off switch, start switch and 20 gal. fuel tank.

Starting Battery: 12-volt D.C., wet cell BCI Group 24 Marine, minimum 420 amps cold cranking, 2-hour reserve capacity.

Alternator: Delco direct driven with flexible coupling, 12-volt, 51-amp, voltage regulator, ammeter, non-resettable hour meter. A weather-resistant, metal enclosure shall be provided to house the meters and switches.

General

All units shall meet or exceed the specifications for advance warning arrow panels as listed in Part 6F.53 of the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) Millennium Edition, December, 2000.

Performance

The flashing arrow must be visible on a sunny day for a distance of one mile. The arrow panel support frame shall contain a device to align the arrow panel to oncoming traffic and to adjust the arrow panel so its bottom edge is relatively level when in use. The panel lamp must be visible during the "on time" at an angle of 15° minimum to both the left and right of center and 4° minimum both up and down of center.

Owner's Manual

The successful bidder shall furnish two Owner's Manuals for each arrow panel. Each manual shall include the manufacturer's instructions for maintenance and operation of the power supply, arrow panel and control. Each manual shall also include a detailed, schematic, wiring diagram showing all circuits and components from the power supply through the control to the arrow panel. The schematic diagram shall list all transistors, resistors, triacs, diodes and other components with the manufacturer's name and part number.

NOTE: For bids to be considered, the attachment entitled "PREFERENCE IN PURCHASING PRODUCTS" must be either attached to the bid or on file in this office and must be dated in the current model year.

NOTE: The attachment entitled "MISSOURI DOMESTIC PRODUCT PROCUREMENT ACT" certificates of compliance must be completed and submitted with your bid for it to be considered responsive.

The undersigned, as bidder, understands that this project involves state funds and the bidder awarded the contract will be required to comply with Executive Order 94-03 of the Governor of the State of Missouri dated January 14, 1994. This order stipulates that there shall be no discriminatory employment practices by the contractor or his subcontractors, if any, based on race, color, religion, creed, national origin, sex, or age. The undersigned contractor or his subcontractors, if any, shall give written notice of their commitments under this clause to any labor union which they have bargaining or other agreements.

BIDS TO BE MAILED TO:
Missouri Department of Transportation
General Services - Fleet
P.O. Box 270
1320 Creek Trail Drive
Jefferson City, Missouri 65102
Clearly marked
Bid Request No. 3-060418

FIRM_____

STREET_____

CITY_____

STATE_____ZIP_____

TELEPHONE _____

SIGNATURE_____

PRINT NAME_____

E-MAIL _____

FEIN # _____

3-060418

NOTICE * * * * NOTICE * * * * NOTICE

The department is interested in assisting Missouri counties, cities, special road districts, etc. in purchasing equipment that meets the Missouri Department of Transportation's specifications.

Each bidder is asked to indicate below whether they would be willing to offer equipment for sale to these local political entities at the same bid price offered to this department.

It is understood the department will not issue purchase orders, accept delivery nor make payment for equipment ordered by any of these agencies. It is further understood the price is based on the unit meeting the department's specifications. Any added options, deletions, or extra freight costs would be negotiated between the local agency and the successful vendor.

Indicate below whether your company is willing to offer such cooperative purchasing for Missouri counties, cities, or other political entities.

YES_____ NO_____

If the price varies throughout the state on department bids, because of different delivery destinations please indicate the price f.o.b. your location that would be offered as described above.

$_____ _____
(Price) (Location)

Company Name_____

Address_____

Phone Number_____

Signature_____

Title_____

Date_____

(Each vendor should complete the appropriate sections of this form and submit with their bid.)

PREFERENCE IN PURCHASING PRODUCTS

DATE: _____

The bidders attention is directed to Section 34.076 RsMO 1986 which gives preference to Missouri corporations, firms, and individuals when letting contracts or purchasing products.

Bids/Quotations received will be evaluated on the basis of this legislation.

All vendors submitting a bid/quotation must furnish ALL information requested below.

FOR CORPORATIONS:

State in which incorporated: _____

FOR OTHERS:

State of domicile: _____

FOR ALL VENDORS:

List address of Missouri offices or places of business:

_____

_____

_____

_____

_____

_____

_____

THIS SECTION MUST BE COMPLETED AND SIGNED:

FIRM NAME: _____

ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

BY (signature required): _____

Federal Tax I.D. #: _____ **if no Federal Tax I.D. # - list Social Security #:** _____

NOTE: For bid/quotation to be considered, the "Preference in Purchasing Products" form must be on file in the General Services (Procurement) Division and must be dated in the current calendar year.

MISSOURI DOMESTIC PRODUCTS PROCUREMENT ACT

The bidder's attention is directed to the Missouri Domestic Products Procurement Act, Sections 34.350 to 34/359, RsMO, which requires all manufactured goods or commodities used or supplied in the performance of this contract or any subcontract to be manufactured or produced in the United States.

Section 34.355, RsMO, requires the vendor or contractor to certify his compliance with Section 34.353 and, if applicable, Section 34.359, RsMO, at the time of bidding **and** prior to payment. Failure to comply with Section 34.353, RsMO, during the performance of the contract **and** to provide certification of compliance prior to payment will result in nonpayment for those goods or commodities.

Section 34.353.2, RsMO, specifies that it does not apply where the total contract is less than Twenty-Five Thousand Dollars ($25,000.00). If your total bid is Twenty-Five Thousand Dollars ($25,000.00) or more, you **must** complete this form as directed below.

Failure to complete and return this document with this bid will cause the State to presume the manufactured goods or products listed in the bid are not manufactured or produced in the United States, and the bid will be evaluated on that basis. Please read the certification appearing below on this form.

[ ] If all the goods or products specified in the attached bid which the bidder proposes to supply to the State shall be manufactured or produced in the "United States" as defined in Section 34.350, RsMO, check the box at left.

[ ] If only one item of any particular goods or products specified in the attached bid is manufactured or produced in the "United States" as defined in Section 34.350, RsMO, check the box at left and list the items (or item number) here:

_____

_____

[ ] If any or all of the goods or products specified in the attached bid which the bidder proposes to supply to the State are **not** manufactured or produced in the "United States" as defined in Section 34.350, RsMO, then: (a) check the box at left; (b) list below, by item (or item number), the country other than the United States where each good or product is manufactured or produced; and (c) check the boxes to the left of the paragraphs below if applicable and list the corresponding items (or item numbers) in the spaces provided.

Item (or item number)	Location Where Item Manufactured or Produced

(attach an additional sheet if necessary)

[ ] The following specified goods or products cannot be manufactured or produced in the United States in sufficient quantities or in time to me the contract specifications. Items (or item numbers): _____

_____

[ ] The following specified goods or products must be treated as manufactured or produced in the United States, in accordance with an existing treaty, law, agreement, or regulation of the United States, including a treaty between the United States and any foreign country regarding export-import restrictions or international trade. Items (or item numbers): _____

_____

MISSOURI DOMESTIC PRODUCTS PROCUREMENT ACT CONTINUED

CERTIFICATION

By submitting this document, completed as directed above, with a bid, the bidder certifies under penalty of making false declaration (Section 575.060, RsMO) that the information contained in this document if true, correct and complete, and may be relied upon by the State in determining the bidders qualifications under and in compliance with the Missouri Domestic Products Procurement Act.

The bidder's failure to complete and return this document with the bid as directed above will cause the State to presume the manufactured goods or products listed in the bid are not manufactured or produced in the United States, and the bid will be evaluated on that basis pursuant to Section 34.353.3(2), RsMO.

All prices must include completed delivery to any of the below listed delivery destinations.

Missouri Department of Transportation
District 1 Garage
3602 N. Belt Highway
St. Joseph, Missouri 64502
General Services Manager, **Mike Prussman**
816-387-2446

Missouri Department of Transportation
District 2 Garage
902 N. Missouri St.
Macon, Missouri 63552
General Services Manager,**Darin Biegal**
660-385-8241

Missouri Department of Transportation
District 3 Garage
Highway 61 South
Hannibal, Missouri 63401
General Services Manager,**Darrell Barnes**
573-248-2590

Missouri Department of Transportation
District 4 Garage
2050 N.E. Independence.
Lee Summit Missouri 64064
General Services Manager, **Cynthia Beebe**
816-622-0053

Missouri Department of Transportation
District 5 Garage
1511 Missouri Blvd
Jefferson City, Missouri 65101
General Services Manager, **Coleen Welter**
573-751-3660

Missouri Department of Transportation
General Services Complex
830 MoDOT Drive
Jefferson City, Missouri 65101
Mechanic Supervisor, **Terry Redel**
573-751-8752

Missouri Department of Transportation
District 6 Garage
2309 Barrett Station Rd.
Ballwin, Missouri 63021
General Services Manager, **Robert Zahner**
314-301-1422

Missouri Department of Transportation
District 7 Garage
3901 East 32nd Street
Joplin, Missouri 64804
General Services Manager, **John Sinclair**
417-629-3220

Missouri Department of Transportation
District 8 Garage
3025 E. Kearney
Springfield, Missouri 65804
General Services Manager, **Brad Leonard**
417-895-7700

Missouri Department of Transportation
District 9 Garage
U.S. Rt. 63 N.
Willow Springs, Missouri 65587
General Services Manager, **Melvin Rodgers**
417-469-6251

Missouri Department of Transportation
District 10 Garage
201 N. Main
Sikeston, Missouri 63801
General Services Manager, **Ronald Miller**
573-472-5318

STANDARD SOLICITATION PROVISIONS

a. The Missouri Department of Transportation (MoDOT) reserves the right to reject any or all bids/quotes/proposals, and to accept or reject any items thereon, and to waive technicalities. In case of error in the extension of prices in the bid/quote/proposal, unit prices will govern.

b. All bids/quotes/proposals must be signed with the firm name and by a responsible officer or employee. Obligations assumed by such signature must be fulfilled.

c. By virtue of statutory authority, a preference will be given to materials, products, supplies, provisions and all other articles produced, manufactured, made or grown, within the State of Missouri.

d. Time of delivery is a part of the consideration and, if not otherwise stated in the solicitation documents, must be stated in definite terms by the Bidder/Offeror and must be adhered to. If time varies on different items, the Bidder/Offeror shall so state.

e. If providing bids/quotes/proposals for commodities, the Bidder/Offeror will state brand or make on each item. If bidding or proposing other than the make, model or brand specified, the manufacturer's name, model number or catalog number must be given.

f. **For bids/proposals of $25,000** or more, no bids/proposals by telephone, telegram or telefax will be accepted. If provided, these bids/proposals should be returned in the MoDOT solicitation return envelope.

g. If a solicitation return envelope is provided by MoDOT, the bid/quote/proposal should be returned in the envelope provided with the Bid/RFQ/RFP Request Number plainly indicated thereon.

h. The date specified for the returning of bids/quotes/proposals is a firm deadline and all bids/quotes/proposals must be received at the designated office by that time. The Department does not recognize the U.S. Mail, Railway Express Agency, Air Express, or any other organization, as its agent for purposes of accepting proposals. All proposals arriving at the designated office after the deadline specified will be rejected.

GENERAL TERMS AND CONDITIONS

General Performance

a. This work is to be performed under the general supervision and direction of the Missouri Department of Transportation (MoDOT) and, if awarded any portion of the work, the Contractor agrees to furnish at his own expense all labor and equipment required to complete the work, it being expressly understood that this solicitation is for completed work based upon the price(s) specified and is not a solicitation for rental of equipment or employment of labor by MoDOT, and MoDOT is to have no direction or control over the employees used by the Contractor in performance of the work.

Deliveries

a. Unless otherwise specified on the solicitation documents or purchase order, suppliers shall give at least 24 hours advance notice of each delivery,. Delivery will only be received between the hours of 8:00 a.m. to 3:00 p.m., Monday through Friday. Material arriving after 3:00 p.m. will not be unloaded until the following workday. No material will be received on Saturday, Sunday or state holidays.

b. If the prices bid herein include the delivery cost of the material, the Contractor agrees to pay all transportation charges on the material as FOB - Destination. Freight costs must be included in the unit price bid and not listed as a separate line item.

c. Any demurrage is to be paid by the Contractor direct to the railroad or carrier.

Nondiscrimination

a. The Bidder/Offeror understands that this project involves state funds and the Bidder/Offeror awarded the contract will be required to comply with the Executive Order 94-03 of the Governor of the State of Missouri dated January 14, 1994. This order stipulates that there shall be no discriminatory employment practices by the Contractor or his subcontractors, if any, based on race, sex, religion, national origin, age, color, disability, or veteran status. The undersigned Contractor or his subcontractors, if any, shall give written notice of their commitments under this clause to any labor union with which they have bargaining or other agreements.

b. The Contractor shall comply with the Regulations relative to nondiscrimination in federally-assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

c. All solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of the Contractor's obligations under this contract and the Regulations, will be relative to nondiscrimination on the grounds of race, color, or national origin.

1) Sanctions for Noncompliance: In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, MoDOT shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

i. withholding of payments to the Contractor under the contract until the Contractor complies, and/or,

ii. cancellation, termination or suspension of the contract, in whole or in part.

Contract/Purchase Order

a. By submitting a bid/quote/proposal, the Bidder/Offeror agrees to furnish any and all equipment, supplies and/or services specified in the solicitation documents, at the prices quoted, pursuant to all requirements and specifications contained therein.

b. A binding contract shall consist of: (1) the solicitation documents, amendments thereto, and/or Best and Final Offer (BAFO) request(s) with any changes/additions, (2) the Contractor's proposal and/or submitted pricing, and (3) the MHTC's acceptance of the proposal and/or bid by purchase order.

c. A notice of award does not constitute an authorization for shipment of equipment or supplies or a directive to proceed with services. Before providing equipment, supplies and/or services, the Contractor must receive a properly authorized purchase order and/or notice to proceed.

d. The contract expresses the complete agreement of the parties and performance shall be governed solely by the specifications and requirements contained therein. Any change, whether by

modification and/or supplementation, must be accomplished by a formal contract amendment signed and approved by and between the duly authorized representative of the Contractor and the duly authorized representative of the MHTC, by a modified purchase order prior to the effective date of such modification. The Contractor expressly and explicitly understands and agrees that no other method and/or no other document, including correspondence, acts, and oral communications by or from any person, shall be used or construed as an amendment or modification.

Subcontracting

a. It is specifically understood that no portion of the material or any interest in the contract, shall be subcontracted, transferred, assigned or otherwise disposed of, except with the written consent of MoDOT. Request for permission to subcontract or otherwise dispose of any part of the work shall be in writing to MoDOT and accompanied by documentation showing that the organization which will perform the work is particularly experienced and equipped for such work.

b. Consent to subcontract or otherwise dispose of any portion of the work shall not be construed to relieve the Contractor of any responsibility for the production and delivery of the contracted work and the completion of the work within the specified time.

c. All payments for work performed by a subcontractor shall be made to the Contractor to whom the contract was awarded and the purchase order issued.

Invoicing and Payment

a. MoDOT is exempt from paying Missouri Sales Tax, Missouri Use Tax and Federal Excise Tax. However, the Contractor may themselves be responsible for the payment of taxes on materials they purchase to fulfill the contract. A Federal Excise Tax Exemption Certificate will be furnished to the successful Bidder/Offeror upon request.

b. Each invoice should be itemized in accordance with items listed on the purchase order and/or contract. The statewide financial management system has been designed to capture certain receipt and payment information. Therefore, each invoice submitted must reference the purchase order number and must be itemized in accordance with items listed on the purchase order. Failure to comply with this requirement may delay processing of invoices for payment.

c. Unless otherwise provided for in the solicitation documents, payment for all equipment, supplies, and/or services required herein shall be made in arrears. The Missouri Highways and Transportation Commission (MHTC) shall not make any advance deposits.

d. The MHTC assumes no obligation for equipment, supplies, and/or services shipped or provided in excess of the quantity ordered. Any authorized quantity is subject to the MHTC's rejection and shall be returned at the Contractor's expense.

Applicable Laws and Regulations

a. The contract shall be construed according to the laws of the State of Missouri. The Contractor shall comply with all local, state, and federal laws and regulations related to the performance of the contract.

b. The Contractor must be registered and maintain good standing with the Secretary of State of the State of Missouri and other regulatory agencies, as may be required by law or regulations. Prior to the issuance of a purchase order and/or notice to proceed, the Contractor may be required to submit to MoDOT a copy of their current Authority Certificate from the Secretary of State of the State of Missouri.

1) Prior to the issuance of a purchase order and/or notice to proceed, all **out-of-state** Contractors **providing services** within the state of Missouri must submit to MoDOT a copy of their current Transient Employer Certificate from the Department of Revenue, in addition to a copy of their current Authority Certificate from the Secretary of State of the State of Missouri.

c. The exclusive venue for any legal proceeding relating to or arising, out of the contract shall be in the Circuit Court of Cole County, Missouri.

Preferences

a. In the evaluation of bids/quotes/proposals, preferences shall be applied in accordance with Chapter 34 RSMo. Contractors should apply the same preferences in selecting subcontractors.

b. By virtue of statutory authority, RSMo. 34.076 and 34.350 to 34.359, a preference will be given to materials, products, supplies, provisions and all other articles produced, manufactured, made or grown within the State of Missouri. Such preference shall be given when quality is equal or better and delivered price is the same or less.

1) If attached, the document entitled **"PREFERENCE IN PURCHASING PRODUCTS"** should be completed and returned with the solicitation documents.

2) If attached, the document entitled **"MISSOURI DOMESTIC PRODUCTS PROCUREMENT ACT"** should be completed and returned with the solicitation documents. **Applies if bid is Twenty-Five Thousand Dollars ($25,000.00) or more**

c. In the event of a tie of low bids, the MHTC reserves the right to establish the method to be used in determining the award

Remedies and Rights

a. No provision in the contract shall be construed, expressly or implied, as a waiver by the MHTC of any existing or future right and/or remedy available by law in the event of any claim by the MHTC of the Contractor's default or breach of contract.

b. The Contractor agrees and understands that the contract shall constitute an assignment by the Contractor to the MHTC of all rights, title and interest in and to all causes of action that the Contractor may have under the antitrust laws of the United States or State of Missouri for which causes of action have accrued or will accrue as the result of or in relation to the particular equipment, supplies, and/or services purchased or produced by the Contractor in the fulfillment of the contract with the MHTC.

c. In the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request MoDOT to enter into such litigation to protect the interests of the MHTC, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

Cancellation of Contract

a. The MHTC may cancel the contract at any time for a material breach of contractual obligations or for convenience by providing the Contractor with written notice of cancellation. Should the MHTC exercise its right to cancel the contract for such reasons, cancellation will become effective upon the date specified in the notice of cancellation sent to the Contractor.

b. If the MHTC cancels the contract for breach, the MHTC reserves the

right to obtain the equipment, supplies, and/or services to be provided pursuant to the contract from other sources and upon such terms and in such manner as the MHTC deems appropriate and charge the Contractor for any additional costs incurred thereby.

Bankruptcy or Insolvency

a. Upon filing for any bankruptcy or insolvency proceeding by or against the Contractor, whether voluntary or involuntary, or upon the appointment of a receiver, trustee, or assigned the benefit or creditors, the Contractor must notify MoDOT immediately. Upon learning of any such actions, the MHTC reserves the right, at its sole discretion, to either cancel the contract or affirm the contract and hold the Contractor responsible for damages.

Inventions, Patents, and Copyrights

a. The Contractor shall defend, protect, and hold harmless the MHTC, its officers, agents, and employees against all suits of law or in equity resulting from patent and copyright infringement concerning the Contractor's performance or products produced under the terms of the contract.

Inspection and Acceptance

a. No equipment, supplies, and/or services received by MoDOT pursuant to a contract shall be deemed accepted until MoDOT has had reasonable opportunity to inspect said equipment, supplies, and/or services.

b. All equipment, supplies, and/or services which do not comply with the specifications and/or requirements or which are otherwise unacceptable or defective may be rejected. In addition, all equipment, supplies, and/or services which are discovered to be defective or which do not conform to any warranty of the Contractor upon inspection (or at any later time if the defects contained were not reasonably ascertainable upon the initial inspection) may be rejected.

c. The MHTC reserves the right to return any such rejected shipment at the Contractor's expense for full credit or replacement and to specify a reasonable date by which replacements must be received.

d. The MHTC's right to reject any unacceptable equipment, supplies, and/or services shall not exclude any other legal, equitable or contractual remedies the MHTC may have.

Warranty

a. The Contractor expressly warrants that all equipment, supplies, and/or services provided shall: (1) conform to each and every specification, drawing, sample or other description which was furnished to or adopted by MoDOT, (2) be fit and sufficient for the purpose expressed in the solicitation documents, (3) be merchantable, (4) be of good materials and workmanship, and (5) be free from defect.

b. Such warranty shall survive delivery and shall not be deemed waived either by reason of the MHTC's acceptance of or payment for said equipment, supplies, and/or services.

Status of Independent Contractor

a. The Contractor represents itself to be an independent Contractor offering such services to the general public and shall not represent itself or its employees to be an employee of the MHTC. Therefore, the Contractor shall assume all legal and financial responsibility for taxes, FICA, employee fringe benefits, workers' compensation, employee insurance, minimum wage requirements, overtime, etc., and agrees to indemnify, save and hold the MHTC, its officers, agents and employees harmless from and against any and all losses (including attorney fees) and damage of any kind related to such matters.

Indemnification

a. The Contractor shall be responsible for injury or damages as a result of any services and/or goods rendered under the terms and conditions of this Agreement.

b. In addition to the liability imposed upon the Contractor on the account of personal injury, bodily injury, including death, or property damage, suffered as a result of the Contractor's performance under this Agreement, the Contractor assumes the obligation to save harmless the Commission, including its agents, employees and assigns, and to indemnify the Commission, including its agents, employees and assigns, from every expense, liability or payment arising out of such wrongful or negligent act or omission, including legal fees.

c. The Contractor also agrees to hold harmless the Commission, including its agents, employees and assigns, from any wrongful or negligent act or omission committed by any subcontractor or other person employed by or under the supervision of the Contractor for any purpose under this Agreement, and to indemnify the Commission, including its agents, employees and assigns, from every expense, liability or payment arising out of such wrongful or negligent act or omission.

SPECIAL TERMS AND CONDITIONS

Insurance

a. The Contractor shall purchase and maintain such insurance as will protect him from claims under workmen's compensation acts and other employee benefit acts, from claims for damages because of bodily injury, including death, and from claims for damages to property which may arise out of or result from the Contractor's operations under this Contract, whether such operations be by himself or by any Subcontractor or anyone directly or indirectly employed by any of them.

b. This insurance shall be written for not less than any limits of liability specified as part of this contract, or required by law, whichever is the greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under this contract. Unless otherwise specified, insurance limits shall be as follows:

1) Workmen's Compensation: Workers Compensation Insurance, including "Occupational Disease Act" requirements, must be maintained **if** required by law.

2) Public Liability (includes property damage and personal injury):

i. Not less than $400,000 for any one person in a single accident or occurrence.

ii. Not less than $2,500,000 for all claims arising out of a single occurrence.

3) Special Hazard Insurance: As required.

4) Builder's Risk: Not less than the full Contract amount.

Required Specifications

a. All materials, equipment, and/or services bid upon must comply with the attached MoDOT Specifications and any other provisions outlined in the solicitation documents.

Information and Reports

a. Submit descriptive literature and specifications showing exact equipment you propose to furnish.

b. A complete list or catalog describing all available training materials related to the items you are bidding must be included in your bid.

Award

a. Award of this bid/quote/proposal will be made on an "Item By Item" basis using the "lowest and best" principle of award

Delivery – Additional Requirements

a. NET DELIVERED FIRM PRICE is construed to be delivered complete and ready for use to the delivery destination, then tested and placed in service with detailed instructions and minimum one day initial training of Department personnel at any other Department facility, plus a one day follow up training with Department personnel per district. Dealer will contact the district to schedule the training classes. The district will have the latitude to schedule the training day that is best for their needs but will be required to give the dealers a three (3) week notice of their requested training dates.

Cancellation of Contract

a. If the Contractor/supplier fails to carry out the performance of the work with sufficient workmen and equipment to insure the completion of the delivery within the time specified or becomes insolvent or is adjudicated a bankrupt or commits any act of bankruptcy or insolvency or allows any final judgment to stand against him for a period of ten (10) days, the Missouri Department of Transportation may give notice in writing by registered mail to the Contractor/supplier and the surety of such delay, neglect or default.

b. If, within ten (10) days after such notice the Contractor/supplier does not proceed to remedy to the satisfaction of the Department's representatives the faults specified in said notice, or the surety does not proceed to take over the deliveries, the Department shall have full power and authority, without impairing the obligation of the Contractor/supplier under the contract or the surety under the bond, to take over the completion of the work and arrange for the shipment of any materials necessary to complete the work and the Contractor/supplier and the surety will be responsible for any additional costs incurred by the Department in obtaining the completion of the deliveries.

Liquidated Damages

a. In the event the successful Contractor fails to deliver the material within the time specified, the Department and the public will sustain damages because of such delay in delivery, the exact extent of which would be difficult to ascertain, and in order to liquidate such damage in advance it is agreed that the **sum of one-hundred dollars ($100.00) per day, per item,** for each assessable calendar day on which the delivery has not been completed, is reasonable and the best estimate which the parties can arrive at as liquidated damages, and it is therefore agreed that said amount will be withheld from payments due the Contractor or otherwise collected from the Contractor as liquidated damages.

b. **Saturdays, Sundays, holidays and days whereas the Department has suspended work** shall not be assessable days.